



Docket No.: YOR919990159US1

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

## Patent Application

Applicant(s): Bolle et al.  
Docket No.: YOR919990159US1  
Serial No.: 09/290,645  
Filing Date: April 12, 1999  
Group: 2134  
Examiner: Matthew Smithers

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TC 1700

Title: System and Method for Liveness Authentication Using an  
Augmented Challenge/Response Scheme

AFFIDAVIT UNDER 37 C.F.R. §1.131

We, the undersigned, hereby declare and state as follows:

1. We are the named inventors of the invention described and claimed in the above-referenced U.S. patent application.

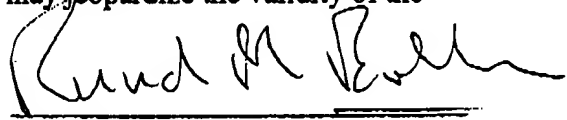
2. In September, 1998, we filed an "Invention Disclosure" (reference YOR8-1998-0524), a copy of which is enclosed as Exhibit 1, at the IBM T.J. Watson Research Center that evidences conception of an invention falling within one or more of the claims of the above-referenced application.

3. The Invention Disclosure cited above contains a description of the claimed invention.


4. All statements made herein of my own knowledge are true, and all statements made on information and belief are believed to be true.

5. I understand that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. §1001, and may jeopardize the validity of the application or any patent issuing thereon.

Date: 9/23/03

  
Ruud M. Bolle

Date: 9/23/03

  
Jonathan H. Connell

Date: 9/25/03

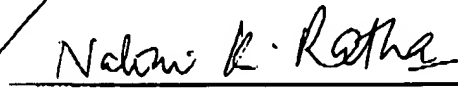

  
Nalini K. Ratha

Exhibit 1 - Page 1

Image validation through challenge response

	<b>Disclosure YOR8-1998-0524</b>
	Created By: Nalini Ratha      Created On: 09/09/98 05:59:38 PM
	Last Modified By: Barbara Rasa      Last Modified On: 09/30/98 11:13:03 AM
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Required fields are marked with the asterisk (\*) and must be filled in to complete the form .

**Summary**

Status	Submitted
Processing Location	YOR
Attorney/Patent Professional	Louis J Percello/Watson/IBM
Submitted Date	09/29/98 04:58:50 PM
Owning Division	RES
PVT Score	37

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**Inventors with Lotus Notes ID's**

Inventors: Jonathan Connell/Watson/IBM, Nalini Ratha/Watson/IBM, Ruud M Bolle/Watson/IBM

Inventor Name > denotes primary contact	Inventor Serial	Div/Dept	Manager Serial	Manager Name
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Bolle, Rudolf M. (Ruud)	085475	22/J8NA	765592	Nunes, Sharon L.

**Inventors without Lotus Notes ID's****IDT Selection****Main Idea****\*Title of disclosure (in English)**

Image validation through challenge response

**\*Idea of disclosure**

1. Describe your invention, stating the problem solved (if appropriate), and indicating the advantages of using the invention.

An inexpensive method to generate tags for live images which can be used to authenticate them later.

Method can be used with fingerprint scanners, face cameras, or document imagers for use in e-commerce.

Multiple encoder units of the same type can be interchanged (nothing specific to a single box).

Tight physical integration prevents external images from being fed into the input.

Method insures image was acquired at time requested (saved image with previous response will not pass).

2. How does the invention solve the problem or achieve an advantage, (a description of "the invention", including figures inline as appropriate)?

The input sensor feeds the sensed image to an encoder built into the same package as the imager. The encoder might be included on the same silicon chip as the imager, as a separate chip in a

Image validation through challenge response

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multi-chip-module or hybrid, or as part of a chip stack. The encoder reads an external challenge from a server and generates a response based on parts of the actual image acquired. The encoding function can optionally be tuned using internal configuration bits (EEPROM, ROM, RAM, laser trimming, etc). Because it uses parts of the actual image, the response is tightly tied to a particular image and hence its "liveness" can be guaranteed. A different challenge can be used for each transaction (the space is large and already-used values can be recorded to prevent re-use) so stored responses have no counterfeiting value. Furthermore, because the only way to feed an image to the encoder is via a channel within the same physical package, there is no way a stored image can be used to generate a valid response to a new challenge.

3. If the same advantage or problem has been identified by others (inside/outside IBM), how have those others solved it and does your solution differ and why is it better?

Even computationally simple encoding functions can be used, system can assure the server that the image was acquired directly in response to its request, the encoding functions can be made unique (no problem with fake ATMs), and the unit can be easily replaced in the field with any unit from the same source.

4. If the invention is implemented in a product or prototype, include technical details, purpose, disclosure details to others and the date of that implementation.

Sept. 28. 1998

**\*Critical Questions ( Questions 1 - 7 must be answered)**

**Patent Value Tool (Optional - this may be used by the inventor and attorney to assist with the evaluation Post Disclosure Text & Drawings)**

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(Form Revised 12/17/97)